



STIC Search Report

EIC 2600

STIC Database Tracking Number: 182764

TO: Christopher Magee
Location: KNXEC79
Art Unit : 2653
Wednesday, March 22, 2006

Case Serial Number: 0990992

From: Samir Patel
Location: EIC 2600
KNX-8B68
Phone: 571-272-3537

Samir.patel@uspto.gov

Search Notes

Dear Examiner,

Attached are the search results (from commercial databases) for your case.

Tags mark the patent/articles, which might be of interest. After you review all records including tagged and untagged records, if you wish to order the complete text of any record, please submit request(s) directly to the STIC-EIC 2600 Email Box.

Please call if you have any questions or suggestions, and I have enclosed a Search Results Feedback Form to facilitate further comments or suggestions.

Thanks

Samir Patel



RUSH SPE SIGNATURE _____

Access DB# 18276

(182)
11

SEARCH REQUEST FORM
Scientific and Technical Information Center

EIC 2600

Requester's Full Name Christopher Magee Examiner # 78795 Date 3/21/06
Art Unit 263 Phone Number 2-157 Serial Number 09902992
Office Location _____ Format preferred (circle) PAPER EMAIL BOTH

KNX 8C7S

If more than one search is submitted, please prioritize searches in order of need.

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Let us know what you already have and so do not need. Include the keywords, synonyms and meaning of acronyms. Define all terms that may have a specific meaning. Please attach a copy of the background, abstract, claims and other pertinent information.

Please state how the terms or keyword strings should relate to one another.

Title of the Invention _____

Inventor(s) _____

Earliest Priority date to be used _____

STAFF USE ONLY

Searcher Carrie Ritel TYPE of Search _____
Phone 2-5537 Text
Location KNX 8C7S Litigation
Date picked up 03/22/9:00a.m Other
Date completed 03/22/8:30p.m
Search Prep/review 80
Online Time 160 120

Databases Searched

Dialog
STN _____
QuestelOrbit _____
LEXIS/NEXIS _____
Courtlink _____
Other _____

File 2:INSPEC 1898-2006/Mar W2
 (c) 2006 Institution of Electrical Engineers
 File 6:NTIS 1964-2006/Mar W2
 (c) 2006 NTIS, Intl Cpyrght All Rights Res
 File 8:Ei Compendex(R) 1970-2006/Mar W2
 (c) 2006 Elsevier Eng. Info. Inc.
 File 27:Foundation Grants Index 1990-2006/Feb
 (c) 2006 Foundation Center
 File 34:SciSearch(R) Cited Ref Sci 1990-2006/Mar W2
 (c) 2006 Inst for Sci Info
 File 35:Dissertation Abs Online 1861-2006/Feb
 (c) 2006 ProQuest Info&Learning
 File 62:SPIN(R) 1975-2006/Mar W1
 (c) 2006 American Institute of Physics
 File 65:Inside Conferences 1993-2006/Mar 22
 (c) 2006 BLDSC all rts. reserv.
 File 92:IHS Intl.Stds.& Specs. 1999/Nov
 (c) 1999 Information Handling Services
 File 94:JICST-EPlus 1985-2006/Dec W4
 (c) 2006 Japan Science and Tech Corp(JST)
 File 95:TEME-Technology & Management 1989-2006/Mar W3
 (c) 2006 FIZ TECHNIK
 File 99:Wilson Appl. Sci & Tech Abs 1983-2006/Feb
 (c) 2006 The HW Wilson Co.
 File 144:Pascal 1973-2006/Feb W4
 (c) 2006 INIST/CNRS
 File 239:Mathsci 1940-2006/Apr
 (c) 2006 American Mathematical Society
 File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
 (c) 1998 Inst for Sci Info
 File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13
 (c) 2002 The Gale Group
 File 603:Newspaper Abstracts 1984-1988
 (c) 2001 ProQuest Info&Learning
 File 483:Newspaper Abs Daily 1986-2006/Mar 21
 (c) 2006 ProQuest Info&Learning
 File 248:PIRA 1975-2006/Feb W4
 (c) 2006 Pira International
 File 56:Computer and Information Systems Abstracts 1966-2006/Mar
 (c) 2006 CSA.
 File 57:Electronics & Communications Abstracts 1966-2006/Feb
 (c) 2006 CSA.
 File 61:Civil Engineering Abstracts. 1966-2006/Mar
 (c) 2006 CSA.
 File 413:DIALOG PRODUCT CODE FINDER(TM) 2006/Feb
 (c) 2006 Dialog
 File 414:Dialog Journal Name Finder(TM) 2006/Feb
 (c) 2006 Dialog

| Set | Items | Description |
|-----|-------|---|
| S1 | 6389 | (CRYSTAL(2N)GRAIN?? OR CRYSTALGRAIN??) (3N) (BOUNDAR??? OR BORDER???) |
| S2 | 9888 | FERROMAGNETIC???(3N)LAYER?? |
| S3 | 94 | ANTIFERROMAGNETIC??(3N)LAYER?? OR ANTI()FERROMAGNETIC??(3N-)LAYER?? |
| S4 | 13334 | (DISCONTINUOUS?? OR NONPARALLEL?? OR NON()PARALLEL?? OR IRREGULAR?? OR ASYMMETRIC???) (7N) (BOUNDAR???? OR BORDER???) |
| S5 | 28449 | AU=(HASEGAWA N? OR HASEGAWA, N? OR SAITO M? OR SAITO, M?) |
| S6 | 1 | FEROMAGNETIC??(2N)LAYER?? |
| S7 | 2 | (ANTIFEROMAGNETIC?? OR ANTI()FEROMAGNETIC???) (2N)LAYER?? |
| S8 | 0 | S1 AND (S2 OR S6) AND (S7 OR S3) AND S4 |

S9 0 (S2 OR S6) AND (S7 OR S3) AND S4
S10 91 (S2 OR S6) AND (S7 OR S3)
S11 0 S10 AND S1
S12 7 S5 AND S1
S13 3 RD (unique items)

13/3,K/1 (Item 1 from file: 2)

DIALOG(R) File 2:INSPEC

(c) 2006 Institution of Electrical Engineers. All rts. reserv.

07373387 INSPEC Abstract Number: A1999-22-8160B-012

Title: Corrosion properties of electroplated CoNiFe films

Author(s): Saito, M. ; Yamada, K.; Ohashi, K.; Yasue, Y.; Sogawa, Y.; Osaka, T.

Author Affiliation: Functional Devices Labs., NEC Corp., Tokyo, Japan

Journal: Journal of the Electrochemical Society vol.146, no.8 p. 2845-8

Publisher: Electrochem. Soc,

Publication Date: Aug. 1999 Country of Publication: USA

CODEN: JESOAN ISSN: 0013-4651

SICI: 0013-4651(199908)146:8L.2845:CPEC;1-N

Material Identity Number: J010-1999-008

U.S. Copyright Clearance Center Code: 0013-4651/99/\$7.00

Language: English

Subfile: A

Copyright 1999, IEE

Author(s): Saito, M. ; Yamada, K.; Ohashi, K.; Yasue, Y.; Sogawa, Y.; Osaka, T.

...Abstract: mV. However, the corrosion resistance improved after annealing at temperatures above 100 degrees C. The **crystal - grain boundaries** in the as-plated film electroplated under a low current density from saccharin-free baths are not clear (i.e., the phase is amorphous), but the **crystal grain boundaries** in the annealed film are clear. Films electroplated from baths containing saccharin also have anodic

...

13/3,K/2 (Item 1 from file: 8)

DIALOG(R) File 8:Ei Compendex(R)

(c) 2006 Elsevier Eng. Info. Inc. All rts. reserv.

03810166 E.I. No: EIP94021218120

Title: Relation between microstructure and soft magnetic properties of nanocrystalline Fe/Fe-Hf-C multilayers

Author: Hasegawa, N. ; Fujimori, H.; Kataoka, N.; Hiraga, K.

Corporate Source: Tohoku Univ, Sendai, Jpn

Conference Title: Proceedings of the 1st International Symposium on Metallic Multilayers

Conference Location: Kyoto, Jpn Conference Date: 19930301-19930305

E.I. Conference No.: 19533

Source: Journal of Magnetism and Magnetic Materials v 126 n 1-3 Sep 1993. p 583-586

Publication Year: 1993

CODEN: JMMMDC ISSN: 0304-8853

Language: English

Author: Hasegawa, N. ; Fujimori, H.; Kataoka, N.; Hiraga, K.

Descriptors: *Metallic superlattices; Iron; Iron alloys; Magnetic properties; Anisotropy; Metallic films; Magnetization; **Crystal microstructure**; **Grain boundaries**; Dispersions

13/3,K/3 (Item 1 from file: 94)

DIALOG(R) File 94:JICST-EPlus

(c)2006 Japan Science and Tech Corp(JST). All rts. reserv.

02798152 JICST ACCESSION NUMBER: 96A0496721 FILE SEGMENT: JICST-E
Development of Large-sized and Complicated Ceramics by Spark Plasma
Sintering(SPS) Method.

SAITO MASAHIRO (1); SUZUKI YASUO (1)

(1) Miyagi Prefect. Inst. of Technol.

Koen Gakkaishi (Journal of High Temperature Society), 1996, VOL.22, NO.2,
PAGE.65-75, FIG.16, TBL.3, REF.17

JOURNAL NUMBER: F0907BAU ISSN NO: 0387-1096

UNIVERSAL DECIMAL CLASSIFICATION: 666.5/.6

LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan

DOCUMENT TYPE: Journal

ARTICLE TYPE: Commentary

MEDIA TYPE: Printed Publication

SAITO MASAHIRO (1); SUZUKI YASUO (1)

...ABSTRACT: to coarsening of crystal grains, and uneven thickness and
distribution of sintering additives in the **crystal grain boundary**
. As a large shape product, possibility of sintering a uniform sintered
compact of .PHI.150mm...

?

File 344:Chinese Patents Abs Jan 1985-2006/Jan
(c) 2006 European Patent Office
File 347:JAPIO Nov 1976-2005/Nov(Updated 060302)
(c) 2006 JPO & JAPIO
File 350:Derwent WPIX 1963-2006/UD,UM &UP=200619
(c) 2006 Thomson Derwent

| Set | Items | Description |
|-----|-------|--|
| S1 | 1810 | (CRYSTAL(2N)GRAIN?? OR CRYSTALGRAIN??) (3N) (BOUNDAR??? OR B- ORDER???) |
| S2 | 10678 | FERROMAGNETIC???(3N)LAYER?? |
| S3 | 571 | ANTIFERROMAGNETIC???(3N)LAYER?? OR ANTI()FERROMAGNETIC???(3N-)LAYER??? |
| S4 | 565 | (DISCONTINUOUS?? OR NONPARALLEL?? OR NON()PARALLEL?? OR IR- REGULAR?? OR ASYMMETRIC???) (7N) (BOUNDAR???? OR BORDER???) |
| S5 | 20844 | AU= (HASEGAWA N? OR HASEGAWA, N? OR SAITO M? OR SAITO, M?) |
| S6 | 4 | FEROMAGNETIC???(2N)LAYER?? |
| S7 | 2 | (ANTIFEROMAGNETIC?? OR ANTI()FEROMAGNETIC???) (2N)LAYER?? |
| S8 | 0 | S1 AND (S2 OR S6) AND (S7 OR S3) AND S4 |
| S9 | 1 | S1 AND (S2 OR S6) AND (S7 OR S3) |
| S10 | 565 | (S2 OR S6) AND (S7 OR S3) |
| S11 | 0 | S10 AND S4 |
| S12 | 1 | S1 AND (S2 OR S6) AND S4 |
| S13 | 1 | S12 NOT S9 |
| S14 | 0 | S1 AND (S7 OR S3) AND S4 |
| S15 | 11 | S5 AND S1 |
| S16 | 3 | S15 AND (S2 OR S3 OR S6 OR S7) |
| S17 | 1 | S16 NOT (S9 OR S12) |
| | ? | |

9/3,K/1 (Item 1 from file: 350)
DIALOG(R) File 350:Derwent WPIX
(c) 2006 Thomson Derwent. All rts. reserv.

017029077 **Image available**
WPI Acc No: 2005-353395/200536
XRAM Acc No: C05-109187
XRXPX Acc No: N05-288460

Magnetic sensing element for detecting magnetic fields recorded on hard disk, has multilayer film having pinned magnetic and free magnetic layers comprising Heusler alloy layer of body-centered cubic structure
Patent Assignee: ALPS ELECTRIC CO LTD (ALPS)
Inventor: HASEGAWA N; IDE Y; SAITO M
Number of Countries: 003 Number of Patents: 003

Patent Family:

| Patent No | Kind | Date | Applicat No | Kind | Date | Week |
|----------------|------|----------|---------------|------|----------|----------|
| US 20050074634 | A1 | 20050407 | US 2004953647 | A | 20040929 | 200536 B |
| JP 2005116701 | A | 20050428 | JP 2003347354 | A | 20031006 | 200536 |
| GB 2406962 | A | 20050413 | GB 200421428 | A | 20040927 | 200536 |

Priority Applications (No Type Date): JP 2003347354 A 20031006

Patent Details:

| Patent No | Kind | Lan Pg | Main IPC | Filing Notes |
|----------------|------|--------|-------------|--------------|
| US 20050074634 | A1 | 20 | G11B-005/64 | |
| JP 2005116701 | A | 21 | H01L-043/08 | |
| GB 2406962 | A | | G11B-005/39 | |

Abstract (Basic):

Technology Focus:

... 112) disposed under the free magnetic layer. A columnar crystal is formed, in which a **crystal grain boundary** formed in the bcc layer, a **crystal grain boundary** appearing in a cut surface in a direction parallel to the thickness of the bcc layer, and a **crystal grain boundary** formed in the Heusler alloy layer are continuous. The crystals of the bcc layer in...

...same direction between the bcc layer and the Heusler alloy layer. The multilayer film includes **anti - ferromagnetic layer** (s) contacting with the pinned magnetic layer. The magnetization direction of the pinned magnetic layer is pinned by the exchange anisotropic magnetic field with the **anti - ferromagnetic layer**. The nonmagnetic layer comprises two nonmagnetic layers, in which the first nonmagnetic layer is disposed on the free...

...layer is disposed under the second nonmagnetic layer. The multilayer film may comprise a first **anti - ferromagnetic layer** disposed on the first pinned magnetic layer, and a second **anti - ferromagnetic layer** disposed under the second pinned magnetic layer. The two **anti - ferromagnetic layers** pin the magnetization direction of each pinned magnetic layer in one direction by the exchange...

?

13/3,K/1 (Item 1 from file: 350)
DIALOG(R) File 350:Derwent WPIX
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014459247 **Image available**
WPI Acc No: 2002-279950/200232
Related WPI Acc No: 2005-569581
XRAM Acc No: C02-082291
XRPX Acc No: N02-218607

Exchange coupling film for magnetoresistive element used for thin film magnetic head includes antiferromagnetic layer made of platinum group element and manganese

Patent Assignee: ALPS ELECTRIC CO LTD (ALPS)

Inventor: HASEGAWA N; SAITO M

Number of Countries: 002 Number of Patents: 002

Patent Family:

| Patent No | Kind | Date | Applicat No | Kind | Date | Week |
|----------------|------|----------|---------------|------|----------|----------|
| US 20020021537 | A1 | 20020221 | US 2001900992 | A | 20010709 | 200232 B |
| JP 2002094141 | A | 20020329 | JP 2000366972 | A | 20001201 | 200238 |

Application number → 09/900,992 Priority Applications (No Type Date): JP 2000366972 A 20001201; JP 2000209462 A 20000711

Patent Details:

| Patent No | Kind | Lan Pg | Main IPC | Filing Notes |
|----------------|------|--------|-------------|--------------|
| US 20020021537 | A1 | 49 | G11B-005/39 | |
| JP 2002094141 | A | 34 | H01L-043/08 | |

Abstract (Basic):

... An exchange coupling film comprises antiferromagnetic and **ferromagnetic layers** formed in contact with each other to pin the magnetization direction of the **ferromagnetic layer** in a predetermined direction by exchange coupling magnetic field produced at interface between layers. The...

... An exchange coupling film comprises antiferromagnetic and **ferromagnetic layers**, which are formed in contact with each other so that the magnetization direction of the **ferromagnetic layer** is pinned in a predetermined direction by an exchange coupling magnetic field produced at interface...

...The **crystal grain boundaries** formed in the antiferromagnetic layer are **discontinuous** in a portion of the interface...

Technology Focus:

... Preferred Components: The equivalent crystal planes in the antiferromagnetic and **ferromagnetic layers** represented by (111) plane are oriented in parallel with the interface. The antiferromagnetic and **ferromagnetic layers** of the film are laminated from the bottom. A seed layer (22) that is non-magnetic at normal temperature is formed below the **ferromagnetic layer**. An underlying **layer** (6) formed below the seed layer. The interface is in an incoherent state...

?

17/3,K/1 (Item 1 from file: 350)

DIALOG(R) File 350:Derwent WPIX
(c) 2006 Thomson Derwent. All rts. reserv.

015450053 **Image available**

WPI Acc No: 2003-512195/200348

XRAM Acc No: C03-137088

XRPX Acc No: N03-406453

Exchange coupling film in magnetic sensing element, includes seed layer comprising chromium in which direction of crystal faces in specific regions are different

Patent Assignee: ALPS ELECTRIC CO LTD (ALPS)

Inventor: HASEGAWA N ; SAITO M ; TANAKA K

Number of Countries: 002 Number of Patents: 003

Patent Family:

| Patent No | Kind | Date | Applicat No | Kind | Date | Week |
|----------------|------|----------|---------------|------|----------|----------|
| US 20030030434 | A1 | 20030213 | US 2002197123 | A | 20020717 | 200348 B |
| JP 2003031871 | A | 20030131 | JP 2001219439 | A | 20010719 | 200348 |
| US 6853521 | B2 | 20050208 | US 2002197123 | A | 20020717 | 200511 |

Priority Applications (No Type Date): JP 2001219439 A 20010719

Patent Details:

| Patent No | Kind | Lan Pg | Main IPC | Filing Notes |
|-----------|------|--------|----------|--------------|
|-----------|------|--------|----------|--------------|

| | | | |
|----------------|----|----|-------------|
| US 20030030434 | A1 | 35 | G01R-033/02 |
|----------------|----|----|-------------|

| | | | |
|---------------|---|----|-------------|
| JP 2003031871 | A | 29 | H01L-043/08 |
|---------------|---|----|-------------|

| | | | |
|------------|----|--|--------------|
| US 6853521 | B2 | | G11B-005/127 |
|------------|----|--|--------------|

Inventor: HASEGAWA N ...

... SAITO M

Abstract (Basic):

... the seed layer. As the magnitude of the unidirectional exchange bias magnetic field of the **ferromagnetic layer** on the seed layer is increased, the **ferromagnetic layer** is pinned properly in desired direction. Maintains the magnetization of the **ferromagnetic layer** fixedly in the desired direction even in high temperature environment. As the crystal grain diameter in each layer deposited between the seed layer is increased, the grain **boundary** diffusion along the **crystal grain boundaries** between the layers is suppressed. Hence electromigration resistance is improved...

?

File 348:EUROPEAN PATENTS 1978-2006/ 200611
(c) 2006 European Patent Office

File 349:PCT FULLTEXT 1979-2006/UB=20060316,UT=20060309
(c) 2006 WIPO/Univentio

| Set | Items | Description |
|-----|-------|--|
| S1 | 1013 | (CRYSTAL(2N)GRAIN?? OR CRYSTALGRAIN??) (3N) (BOUNDAR??? OR B- ORDER???) |
| S2 | 1992 | FERROMAGNETIC???(3N)LAYER?? |
| S3 | 170 | ANTIFERROMAGNETIC???(3N)LAYER?? OR ANTI()FERROMAGNETIC???(3N-)LAYER?? |
| S4 | 1205 | (DISCONTINUOUS?? OR NONPARALLEL?? OR NON()PARALLEL?? OR IR- REGULAR?? OR ASYMMETRIC???) (7N) (BOUNDAR???? OR BORDER???) |
| S5 | 1111 | AU=(HASEGAWA N? OR HASEGAWA, N? OR SAITO M? OR SAITO, M?) |
| S6 | 2 | FEROMAGNETIC???(2N)LAYER?? |
| S7 | 1 | (ANTIFERROMAGNETIC?? OR ANTI()FEROMAGNETIC???) (2N)LAYER?? |
| S8 | 0 | S1 AND (S2 OR S6) AND (S3 OR S7) AND S4 |
| S9 | 0 | S1 AND (S2 OR S6) AND (S3 OR S7) |
| S10 | 168 | (S2 OR S6) AND (S3 OR S7) |
| S11 | 0 | S10 AND (S1 OR S4) |
| S12 | 2 | S5 AND S1 |

12/3,K/1 (Item 1 from file: 348)
DIALOG(R) File 348:EUROPEAN PATENTS
(c) 2006 European Patent Office. All rts. reserv.

01572306

12Cr alloy steel for a turbine rotor

12 Chrom legierter Stahl

Rotor de turbine en acier allie au 12 chrome

PATENT ASSIGNEE:

Mitsubishi Heavy Industries, Ltd., (1291815), 5-1, Marunouchi 2-chome,
Chiyoda-ku, Tokyo, (JP), (Applicant designated States: all)

INVENTOR:

Kamada, Masatomo, Nagasaki Research & Devpt Center, Mitsubishi Heavy Ind.
Ltd., 5-717-1 Fukahori-machi, Nagasaki-shi, Nagasaki-ken, (JP)
Saito, Masahiro, Nagasaki Research & Devpt Center, Mitsubishi Heavy
Ind. Ltd., 5-717-1 Fukahori-machi, Nagasaki-shi, Nagasaki-ken, (JP)
Fujita, Akitsugu, Nagasaki Research & Devpt Center, Mitsubishi Heavy Ind.
Ltd., 5-717-1 Fukahori-machi, Nagasaki-shi, Nagasaki-ken, (JP)
Takano, Yusaku, c/o Choryo Engineering Co., Ltd., 717-1, Fukahori-machi,
5-chome, Nagasaki-shi, Nagasaki-ken, (JP)

LEGAL REPRESENTATIVE:

Henkel, Feiler, Hanzel (100401), Mohlstrasse 37, 81675 Munchen, (DE)
PATENT (CC, No, Kind, Date): EP 1306458 A2 030502 (Basic)

EP 1306458 A3 030827

APPLICATION (CC, No, Date): EP 2002023904 021024;

PRIORITY (CC, No, Date): JP 2001328149 011025

DESIGNATED STATES: DE; FR; GB; IT

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS (V7): C22C-038/44; C21D-006/00

ABSTRACT WORD COUNT: 88

NOTE:

Figure number on first page: NONE

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

| Available Text | Language | Update | Word Count |
|------------------------------------|-----------|--------|------------|
| CLAIMS A | (English) | 200318 | 691 |
| SPEC A | (English) | 200318 | 6446 |
| Total word count - document A | | | 7137 |
| Total word count - document B | | | 0 |
| Total word count - documents A + B | | | 7137 |

INVENTOR:

... JP)

Saito, Masahiro, Nagasaki Research & Devpt Center ...

...SPECIFICATION 0.001 to 0.009%.

(11) B (boron)

If appropriately added, B functions to stabilize **crystal grain boundaries** and has the effect to prevent selective corrosion of the grain boundaries. If the quantity...

...are impurities mixed in from the steel making material. All of them segregate in the **crystal grain boundaries** and lowers the grain boundary strength. This results in lowering the toughness as well as...

12/3,K/2 (Item 2 from file: 348)
DIALOG(R) File 348:EUROPEAN PATENTS

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00361655

Cathode for electron tube.

Kathode fur eine Elektronenrohre.

Cathode pour tube electronique.

PATENT ASSIGNEE:

MITSUBISHI DENKI KABUSHIKI KAISHA, (208580), 2-3, Marunouchi 2-chome
Chiyoda-ku, Tokyo 100, (JP), (applicant designated states: DE;FR;GB;NL)

INVENTOR:

Watanabe, Keiji Mitsubishi Denki K.K., Shohin Kenkyusho 14-40 Oofuna
2-chome, Kamakura-shi Kanagawa-ken, (JP)
Fukuyama, Keiji Mitsubishi Denki K.K., Shohin Kenkyusho 14-40 Oofuna
2-chome, Kamakura-shi Kanagawa-ken, (JP)
Masako, Ishida Mitsubishi Denki K.K., Shohin Kenkyusho 14-40 Oofuna
2-chome, Kamakura-shi Kanagawa-ken, (JP)
Suzuki, Ryo Mitsubishi Denki K.K., Shohin Kenkyusho 14-40 Oofuna 2-chome,
Kamakura-shi Kanagawa-ken, (JP)
Saito, Masato Mitsubishi Denki K.K., Shohin Kenkyusho 14-40 Oofuna
2-chome, Kamakura-shi Kanagawa-ken, (JP)

LEGAL REPRESENTATIVE:

Beresford, Keith Denis Lewis et al (28273), BERESFORD & Co. 2-5 Warwick
Court High Holborn, London WC1R 5DJ, (GB)

PATENT (CC, No, Kind, Date): EP 330355 A2 890830 (Basic)
EP 330355 A3 900822
EP 330355 B1 940803

APPLICATION (CC, No, Date): EP 89301345 890213;

PRIORITY (CC, No, Date): JP 8849083 880301; JP 8840318 880223; JP 8862121
880315; JP 8897873 880419

DESIGNATED STATES: DE; FR; GB; NL

INTERNATIONAL PATENT CLASS (V7): H01J-001/20;

ABSTRACT WORD COUNT: 67

LANGUAGE (Publication,Procedural,Application): English; English; English
FULLTEXT AVAILABILITY:

| Available Text | Language | Update | Word Count |
|------------------------------------|-----------|--------|------------|
| CLAIMS A | (English) | EPBBF1 | 392 |
| CLAIMS B | (English) | EPBBF1 | 433 |
| CLAIMS B | (German) | EPBBF1 | 416 |
| CLAIMS B | (French) | EPBBF1 | 490 |
| SPEC A | (English) | EPBBF1 | 2341 |
| SPEC B | (English) | EPBBF1 | 2312 |
| Total word count - document A | | | 2733 |
| Total word count - document B | | | 3651 |
| Total word count - documents A + B | | | 6384 |

INVENTOR:

... JP)

Saito, Masato Mitsubishi Denki K.K ...

...SPECIFICATION the formulas (1) and (2). Particularly, the interface layer tends to be formed at nickel **crystal grain boundaries** near the interface region and at a position of about 10(μ m) from the...

...SPECIFICATION the formulas (1) and (2). Particularly, the interface layer tends to be formed at nickel **crystal grain boundaries** near the interface region and at a position of about 10(μ m) from the...

?

File 9:Business & Industry(R) Jul/1994-2006/Mar 20
(c) 2006 The Gale Group

File 15:ABI/Inform(R) 1971-2006/Mar 22
(c) 2006 ProQuest Info&Learning

File 16:Gale Group PROMT(R) 1990-2006/Mar 22
(c) 2006 The Gale Group

File 20:Dialog Global Reporter 1997-2006/Mar 22
(c) 2006 Dialog

File 47:Gale Group Magazine DB(TM) 1959-2006/Mar 21
(c) 2006 The Gale group

File 75:TGG Management Contents(R) 86-2006/Mar W2
(c) 2006 The Gale Group

File 80:TGG Aerospace/Def.Mkts(R) 1982-2006/Mar 21
(c) 2006 The Gale Group

File 88:Gale Group Business A.R.T.S. 1976-2006/Mar 15
(c) 2006 The Gale Group

File 98:General Sci Abs 1984-2004/Dec
(c) 2005 The HW Wilson Co.

File 112:UBM Industry News 1998-2004/Jan 27
(c) 2004 United Business Media

File 141:Readers Guide 1983-2004/Dec
(c) 2005 The HW Wilson Co

File 148:Gale Group Trade & Industry DB 1976-2006/Mar 21
(c) 2006 The Gale Group

File 160:Gale Group PROMT(R) 1972-1989
(c) 1999 The Gale Group

File 275:Gale Group Computer DB(TM) 1983-2006/Mar 21
(c) 2006 The Gale Group

File 264:DIALOG Defense Newsletters 1989-2006/Mar 20
(c) 2006 Dialog

File 369:New Scientist 1994-2006/Aug W4
(c) 2006 Reed Business Information Ltd.

File 370:Science 1996-1999/Jul W3
(c) 1999 AAAS

File 484:Periodical Abs Plustext 1986-2006/Mar W3
(c) 2006 ProQuest

File 553:Wilson Bus. Abs. 1982-2006/Mar
(c) 2006 The HW Wilson Co

File 570:Gale Group MARS(R) 1984-2006/Mar 21
(c) 2006 The Gale Group

File 608:KR/T Bus.News. 1992-2006/Mar 22
(c) 2006 Knight Ridder/Tribune Bus News

File 620:EIU:Viewswire 2006/Mar 21
(c) 2006 Economist Intelligence Unit

File 613:PR Newswire 1999-2006/Mar 22
(c) 2006 PR Newswire Association Inc

File 621:Gale Group New Prod.Annou.(R) 1985-2006/Mar 21
(c) 2006 The Gale Group

File 623:Business Week 1985-2006/Mar 21
(c) 2006 The McGraw-Hill Companies Inc

File 624:McGraw-Hill Publications 1985-2006/Mar 22
(c) 2006 McGraw-Hill Co. Inc

File 634:San Jose Mercury Jun 1985-2006/Mar 21
(c) 2006 San Jose Mercury News

File 635:Business Dateline(R) 1985-2006/Mar 22
(c) 2006 ProQuest Info&Learning

File 636:Gale Group Newsletter DB(TM) 1987-2006/Mar 21
(c) 2006 The Gale Group

File 647:CMP Computer Fulltext 1988-2006/Apr W2
(c) 2006 CMP Media, LLC

File 696:DIALOG Telecom. Newsletters 1995-2006/Mar 22

(c) 2006 Dialog
File 674:Computer News Fulltext 1989-2006/Mar W2
(c) 2006 IDG Communications
File 810:Business Wire 1986-1999/Feb 28
(c) 1999 Business Wire
File 813:PR Newswire 1987-1999/Apr 30
(c) 1999 PR Newswire Association Inc
File 587:Jane`s Defense&Aerospace 2006/Mar W3
(c) 2006 Jane`s Information Group

| Set | Items | Description |
|-----|-------|---|
| S1 | 112 | (CRYSTAL(2N)GRAIN?? OR CRYSTALGRAIN??) (3N) (BOUNDAR??? OR B- ORDER???) |
| S2 | 454 | FERROMAGNETIC???(3N)LAYER?? |
| S3 | 37 | ANTIFERROMAGENTIC???(3N)LAYER?? OR ANTI()FERROMAGNETIC???(3N-) LAYER?? |
| S4 | 1867 | (DISCONTINUOUS?? OR NONPARALLEL?? OR NON()PARALLEL?? OR IR- REGULAR?? OR ASYMMETRIC???) (7N) (BOUNDAR???? OR BORDER???) |
| S5 | 248 | AU=(HASEGAWA N? OR HASEGAWA, N? OR SAITO M? OR SAITO, M?) |
| S6 | 3 | FEROMAGNETIC???(2N)LAYER?? |
| S7 | 0 | (ANTIFEROMAGNETIC?? OR ANTI()FEROMAGNETIC???) (2N)LAYER?? |
| S8 | 0 | S1 AND (S2 OR S6) AND (S7 OR S3) AND S4 |
| S9 | 2 | S1 AND (S2 OR S6) AND (S7 OR S3) |
| S10 | 34 | (S2 OR S6) AND (S7 OR S3) |
| S11 | 21 | RD (unique items) |
| S12 | 11 | S11 NOT PY>2000 |
| S13 | 0 | S5 AND S1 |

9/3,K/1 (Item 1 from file: 9)
DIALOG(R) File 9:Business & Industry(R)
(c) 2006 The Gale Group. All rts. reserv.

02742823 Supplier Number: 25234793 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Spin valves drown noise

Electronic Engineering Times UK, p 12
May 07, 2002
DOCUMENT TYPE: Journal ISSN: 0142-3118 (United Kingdom)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 180

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:

...member of the research team from Plymouth, said: "Conventional spin valve sensors consist of two **ferromagnetic** (FM) **layers** separated by a copper layer.

"One of the FM layers is pinned by an **anti - ferromagnetic** **layer** and the other FM layer is magnetically free.

"Despite the linear magnetoresistance response, Barkhausen noises...
...noise is generally seen as small discontinuities in the magnetic field caused by impurities and **crystal grain boundaries** in the magnet.

It is possible to reduce the effect of Barkhausen noise on the...

9/3,K/2 (Item 1 from file: 112)
DIALOG(R) File 112:UBM Industry News
(c) 2004 United Business Media. All rts. reserv.

01350583 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Spin valves drown noise
Electronic Engineering Times UK , p 12
May 07, 2002
LANGUAGE: English RECORD TYPE: Fulltext DOC. TYPE: Journal
WORD COUNT: 00000196

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:

...member of the research team from Plymouth, said: "Conventional spin valve sensors consist of two **ferromagnetic** (FM) **layers** separated by a copper layer.

"One of the FM layers is pinned by an **anti - ferromagnetic** **layer** and the other FM layer is magnetically free.

"Despite the linear magnetoresistance response, Barkhausen noises...

...noise is generally seen as small discontinuities in the magnetic field caused by impurities and **crystal grain boundaries** in the magnet.

It is possible to reduce the effect of Barkhausen noise on the...

?

12/3,K/1 (Item 1 from file: 9)
DIALOG(R) File 9:Business & Industry(R)
(c) 2006 The Gale Group. All rts. reserv.

01832753 Supplier Number: 24637973 (USE FORMAT 7 OR 9 FOR FULLTEXT)
For U.S. defense subcontractors and the Japanese chip vendors scrambling to catch up in R&D . . . Magnetic RAMs hold powerful attraction
(Japan's semiconductor industry is moving toward magnetic RAMs, propelled by market prospects for advanced nonvolatile technologies)
Electronic Engineering Times, p 1
May 03, 1999
DOCUMENT TYPE: Journal ISSN: 0192-1541 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 1609

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...a sheath of copper. At the base of one of the electrodes is a fixed **anti - ferromagnetic layer** that creates a strong coupling field.

When a magnetic field is applied, electrons flow from...

12/3,K/2 (Item 2 from file: 9)
DIALOG(R) File 9:Business & Industry(R)
(c) 2006 The Gale Group. All rts. reserv.

01308639 Supplier Number: 23957475 (USE FORMAT 7 OR 9 FOR FULLTEXT)
Tunneling scheme may boost disk-drive capacities -- Fujitsu advances TMR film
(Fujitsu Ltd (Japan) researchers are claiming progress in the race to create tunnel magnetoresistive films, which eventually could lead to a dramatic boost in hard-disk drive densities)
Electronic Engineering Times, p 88
July 07, 1997
DOCUMENT TYPE: Journal ISSN: 0192-1541 (United States)
LANGUAGE: English RECORD TYPE: Fulltext
WORD COUNT: 547

(USE FORMAT 7 OR 9 FOR FULLTEXT)

TEXT:
...of Ni-Fe, Co, Al₂O₃, Co, NiFe and FeMn. The basic structure is an insulation **layer** (Al₂O₃), sandwiched by **ferromagnetic** materials (NiFe), and cobalt layers inserted to improve the magnetoresistive effect. The FeMn **layer** is an **anti - ferromagnetic layer** that directs the magnetic force of the adjacent Co and NiFe layers. The structure is...

12/3,K/3 (Item 1 from file: 16)
DIALOG(R) File 16:Gale Group PROMT(R)
(c) 2006 The Gale Group. All rts. reserv.

07174041 Supplier Number: 61344780 (USE FORMAT 7 FOR FULLTEXT)
Fujitsu Develops HDD Media Technology with Potential for 300Gb/sq.inch Recording Density; 56 Gb/sq.in. Recording Density Already Demonstrated.
Business Wire, p1357
April 6, 2000

Language: English Record Type: Fulltext
Document Type: Newswire; Trade
Word Count: 641

... stabilizing layer does not affect information output, and by firmly coupling magnetically with the recording layer (anti - ferromagnetic coupling) it stabilizes recording signals from degradation, even at higher recording density.

-- As a result...

12/3,K/4 (Item 2 from file: 16)
DIALOG(R) File 16:Gale Group PROMT(R)
(c) 2006 The Gale Group. All rts. reserv.

06309580 Supplier Number: 54530332 (USE FORMAT 7 FOR FULLTEXT)
For U.S. defense subcontractors and the Japanese chip vendors scrambling to catch up in R&D . . . Magnetic RAMs hold powerful attraction. (magnetic random access memory) (Industry Trend or Event)
Cataldo, Anthony
Electronic Engineering Times, p1(1)
May 3, 1999
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 1668

... a sheath of copper. At the base of one of the electrodes is a fixed anti - ferromagnetic layer that creates a strong coupling field.
When a magnetic field is applied, electrons flow from...

12/3,K/5 (Item 3 from file: 16)
DIALOG(R) File 16:Gale Group PROMT(R)
(c) 2006 The Gale Group. All rts. reserv.

05121140 Supplier Number: 47818872 (USE FORMAT 7 FOR FULLTEXT)
Tunneling scheme may boost disk-drive capacities: Fujitsu advances TMR film
Hara, Yoshiko
Electronic Engineering Times, p88
July 7, 1997
Language: English Record Type: Fulltext
Document Type: Magazine/Journal; Trade
Word Count: 567

... of Ni-Fe, Co, Al₂O₃, Co, NiFe and FeMn. The basic structure is an insulation layer (Al₂O₃), sandwiched by ferromagnetic materials (NiFe), and cobalt layers inserted to improve the magnetoresistive effect. The FeMn layer is an anti - ferromagnetic layer that directs the magnetic force of the adjacent Co and NiFe layers. The structure is...

12/3,K/6 (Item 1 from file: 20)
DIALOG(R) File 20:Dialog Global Reporter
(c) 2006 Dialog. All rts. reserv.

10442171 (USE FORMAT 7 OR 9 FOR FULLTEXT)
FUJITSU: Fujitsu develops HDD media technology with potential for

300Gb/sq.inch recording density; 56 Gb/sq.in. recording density already demonstrated

M2 PRESSWIRE

April 06, 2000

JOURNAL CODE: WMPR LANGUAGE: English RECORD TYPE: FULLTEXT

WORD COUNT: 717

(USE FORMAT 7 OR 9 FOR FULLTEXT)

... stabilizing layer does not affect information output, and by firmly coupling magnetically with the recording **layer** (**anti - ferromagnetic** coupling) it stabilizes recording signals from degradation, even at higher recording density.

* As a result...

12/3,K/7 (Item 1 from file: 47)

DIALOG(R) File 47:Gale Group Magazine DB(TM)

(c) 2006 The Gale group. All rts. reserv.

05224507 SUPPLIER NUMBER: 21052762 (USE FORMAT 7 OR 9 FOR FULL TEXT)

The magnetic stability of spin-dependent tunneling devices.

Gider, S.; Parkin, S.S.P.

Science, v281, n5378, p797(3)

August 7, 1998

ISSN: 0036-8075 LANGUAGE: English RECORD TYPE: Fulltext; Abstract

WORD COUNT: 2798 LINE COUNT: 00214

AUTHOR ABSTRACT: The tunneling resistance between two **ferromagnetic** metal **layers** that are separated by a thin insulator depends on the relative orientation of the magnetization...

TEXT:

...extensively studied for disk and memory applications (5). A spin valve is composed of two **ferromagnetic** (FM) **layers** (such as Permalloy or Co) with a spacer layer of a nonmagnetic conductor (typically Cu...

... zero field by exchange biasing; M of the reference layer is pinned to an adjacent **anti - ferromagnetic** (AF) **layer** through an exchange interaction, which effectively acts as an internal field on the reference layer...

12/3,K/8 (Item 1 from file: 88)

DIALOG(R) File 88:Gale Group Business A.R.T.S.

(c) 2006 The Gale Group. All rts. reserv.

05387014 SUPPLIER NUMBER: 61794732

Technology to expand hard-drive disk capacity.(Brief Article)

New Materials Japan, 6

May, 2000

DOCUMENT TYPE: Brief Article ISSN: 0265-3443 LANGUAGE: English

RECORD TYPE: Fulltext

WORD COUNT: 306 LINE COUNT: 00028

... stabilising layer does not affect information output, and by firmly coupling magnetically with the recording **layer** (**anti - ferromagnetic** coupling) it stabilises recording signals from degradation, even at higher recording densities.

For further information...

12/3,K/9 (Item 2 from file: 88)
DIALOG(R)File 88:Gale Group Business A.R.T.S.
(c) 2006 The Gale Group. All rts. reserv.

04632432 SUPPLIER NUMBER: 20192377
Dual spin-valve with Pd-Pt-Mn anti - ferromagnetic layer .(Special Issue: The 1997 IEEE International Magnetics Conference (INTERMAG '97))
Tanaka, A.; Shimizu, Y.; Kishi, H.; Nagasaka, K.; Oshiki, M.
IEEE Transactions on Magnetics, v33, n5, p3592(3)
Sep, 1997
ISSN: 0018-9464 LANGUAGE: English RECORD TYPE: Abstract

Dual spin-valve with Pd-Pt-Mn anti - ferromagnetic layer .(Special Issue: The 1997 IEEE International Magnetics Conference (INTERMAG '97))

...AUTHOR ABSTRACT: Using this Ta/Ni-Fe buffer layer, dual spin-valve films with Pd-Pt-Mn **anti - ferromagnetic layers** were fabricated. After a 230 (degrees) C anneal to order the Pd-Pt-Mn, the...

12/3,K/10 (Item 3 from file: 88)
DIALOG(R)File 88:Gale Group Business A.R.T.S.
(c) 2006 The Gale Group. All rts. reserv.

04223232 SUPPLIER NUMBER: 19265015
Magnetoresistance in spin-valve structures with Ni-oxide/Co-oxide bilayer antiferromagnets.(The 1996 IEEE International Magnetics Conference) (INTERMAG '96)
Fujikata, Jun-ichi; Hayashi, Kazuhiko; Yamamoto, Hidefumi; Nakada, Masafumi
IEEE Transactions on Magnetics, v32, n5, p4621(3)
Sep, 1996
ISSN: 0018-9464 LANGUAGE: English RECORD TYPE: Abstract

AUTHOR ABSTRACT: Ni-oxide/Co-oxide bilayers are applied to **anti - ferromagnetic layers** in spin-valve multilayers. Hysteresis in MR curves is greatly reduced by optimizing the thickness...

12/3,K/11 (Item 1 from file: 636)
DIALOG(R)File 636:Gale Group Newsletter DB(TM)
(c) 2006 The Gale Group. All rts. reserv.

04644374 Supplier Number: 61794732 (USE FORMAT 7 FOR FULLTEXT)
Technology to expand hard-drive disk capacity.
New Materials Japan, p6
May, 2000
Language: English Record Type: Fulltext
Document Type: Newsletter; Trade
Word Count: 276

... stabilising layer does not affect information output, and by firmly coupling magnetically with the recording **layer** (**anti - ferromagnetic** coupling) it stabilises recording signals from degradation, even at higher recording densities.

For further information...

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